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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

OPP OFFICIAL RECORD
HEALTH EFFECTS DIVISION
SCIENTIFIC DATA REVIEWS
EPA SERIES 361

SUBJECT: **2,4-DB** (030019) Magnitude of the Residue and Processing Studies for Alfalfa and Peanuts. GDLNs 171-4(k), 171-4(l).
DP Barcode: D215039 and D2157586 (duplicate); CBRS No. 15509 and 15640 ; MRID Nos.: 436203-01 and 436212-01; Case No. 0196.

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CBRS has been asked to review a 2,4-DB submission on the magnitude of the residue in alfalfa and peanuts as well as alfalfa and peanut processing studies. This information was submitted by the 2,4-DB Task Force (consisting of A.H. Marks and Co. Ltd., Aceto Agricultural Chemicals, Cedar Chemical Corporation, and Rhone-Poulenc Ag Company) in response to the 2,4-DB Reregistration Standard, dated 2/1/88. These submissions are evaluated herein for their adequacy in fulfilling the residue chemistry data requirements for 2,4-DB reregistration.

Data pertaining to the qualitative nature of the residue in plants (alfalfa, peanuts, and soybeans) and animals (lactating goats and laying hens) have been reviewed by the Agency (D. Miller, 1/26/96, CBRS Nos. 12753, 12931, and 12963, DP Barcodes D196291, D197243, and D197685).

The HED Metabolism Committee determined that 2,4-DB *per se* is the only residue to be regulated in plants, provided that no additional uses on any human food items are sought (D. Miller, 1/29/96, CBRS No. 16665, DP Barcode No.: D221954).

Tolerances for residues of 2,4-DB in/on plant commodities are currently expressed in terms of the combined residues of 2,4-DB [4-(2,4-dichlorophenoxy)butyric acid] and its metabolite 2,4-dichlorophenoxyacetic acid (2,4-D) [40 CFR 180.331]; these will be changed to agree with the HED Metabolism Committee decision at the time of reregistration. The Pesticide Analytical Manual (PAM) Vol. II, lists Method I, a GC method with microcoulometric detection, for the enforcement of tolerances for 2,4-DB residues; this method is the PAM Vol. I method for chlorophenoxy acid residues in food. No tolerances have been established for 2,4-DB residues of concern in animal commodities. There are no established or proposed Codex MRLs for 2,4-DB residues. Therefore, there are no issues of compatibility with respect to U.S. tolerances and Codex MRLs.

CONCLUSIONS AND RECOMMENDATIONS

1. The recovery data indicate that the GC/ECD method is adequate for 2,4-DB (as well as the 2,4-D, and 2,4-DCP metabolites) data collection in alfalfa and peanut raw agricultural and processed commodities. Although CBRS was concerned with level of 2,4-DB residues found in control samples, we nevertheless conclude that the analytical method used for data collection is acceptable.

2. CBRS will translate storage stability data from soybean commodities reviewed previously to alfalfa and peanut commodities. Since 2,4-DB has been found to be stable in soybean commodities for periods of at least 25 months, CBRS concludes there are no storage stability concerns associated with the present alfalfa and peanut field trial studies since storage intervals did not exceed 2 years.

3. The submitted alfalfa field trial data are adequate to satisfy reregistration requirements for magnitude of the residue in alfalfa forage. The registrants have provided sufficient field trial data with adequate geographic representation reflecting various registered use patterns. The residues of 2,4-DB in/on alfalfa forage at 30, 60, and 90 days ranged from ND (<0.05) to 0.49 ppm (excluding a 2.23 ppm outlier), ND to 0.15 ppm (excluding a 1.53 ppm outlier), and ND to 0.26 ppm, respectively, in/on newly-seeded or established alfalfa following fall or spring treatment with 1.5 lbs ae/A per label directions. The current tolerance for alfalfa forage of 0.2(N) ppm is inadequate: the registrant should propose to increase the tolerance to 0.7 ppm and propose a 30 day PHI. All labels should be changed to reflect this maximum permitted use rate and use timing.

4. There is no current tolerance for alfalfa hay. Based on a 30 day pre-cutting interval, the registrant should propose a tolerance on alfalfa hay of 2 ppm.

5. The submitted peanut field trial data are adequate to satisfy reregistration requirements for magnitude of the residue in peanut nutmeat; The registrants have provided sufficient field trial data with adequate geographic representation reflecting various registered use patterns. Residues of 2,4-DB in/on all 11 samples of peanut nutmeat following an application of 2,4-DB at 0.4 lbs ae/A (4-5 weeks after planting) and a second application of 0.4 lbs ae/A at 8-9 weeks following planting were ND (<0.05). These application schedules represent PHIs of 53 to 104 days. The current tolerance (based on combined residues of 2,4-DB and 2,4-D for peanut nutmeat of 0.2(N) ppm) can be lowered to 0.05 ppm: the registrant should petition to decrease the current tolerance to 0.05 ppm and should change all labels to reflect this maximum use rate and use timing.

6. There is no current tolerance for peanut hay. Following two treatments at 0.4 lbs ae/A, residues in peanut hay from the 11 trial sites ranged from 0.08 ppm to 0.55 ppm. Based on a 53-104 day pre-cutting interval and the field trial data presented by the registrant, the registrant should either propose a tolerance on alfalfa hay of 0.6 ppm or amend all labels to prohibit the grazing or feeding of treated peanut hay to livestock.

7. There are presently no 2,4-DB tolerances on peanut vines or hulls. Per Table II (September, 1995), CBRS no longer considers these commodities to be significant feed items. Therefore, no tolerances for these items need be proposed.

8. The registrant adequately demonstrated that residues of 2,4-DB did not concentrate in meal or refined oil processed from peanut nutmeat bearing detectable residues of 2,4-DB following treatment with exaggerated rates of 2,4-DB. The peanut processing study is adequate. No separate 409 tolerances or Section 701 MRLs are required for processed commodities of peanuts.

*** NOTE TO SRRD: The registrant should be informed that the label for peanuts on EPA Reg. No. 264-105 is contradictory: instructions indicate that the product can be applied up to 12 weeks (or 84 days) after planting, but state subsequently that it should not be applied later than 100 days after planting.

DETAILED CONSIDERATIONS

Residue Analytical Methods

Samples of alfalfa and peanut commodities from the submitted field trials and processing studies (MRIDs 43620301 and 43621201) were analyzed for residues of 2,4-DB, 2,4-D, and 2,4-dichlorophenol (2,4-DCP) using a GC method with electron capture detection (ECD) by PTRL East, Inc. (Richmond, KY). A description of this method and supporting validation data have been submitted for soybean commodities and alfalfa meal and reviewed by CBRS (D. Miller,

date, CBRS Nos. 12753, 12931, and 12963, DP Barcodes D196291, D197243, and D197685 relating to analytical method in soybeans and D. Miller, 2/20/96, CBRS No. 13585, DP Barcode D202434 relating to analytical methods in processed soybean and alfalfa commodities). CBRS concluded that the method was marginally adequate for collection of 2,4-DB residue data from field trials and processing studies but that the method must be adequately tested (e.g., concurrent fortification recoveries) for each study in which it is used.

Briefly, alfalfa and peanut matrices were extracted with acidified acetonitrile and centrifuged; The ACN extracts were mixed with deionized water, and readjusted to pH 2 with HCl:water, if necessary. The aqueous extract was then partitioned three times with ethyl ether. The resulting ether fractions were combined and partitioned four times with water adjusted to pH 11 with sodium hydroxide. The aqueous extract was then applied to C18 and C8 solid-phase extraction (SPE) columns and a portion of the extract analyzed for 2,4-DCP.

The remainder of the concentrated sample was mixed with diazomethane in ether and derivatized with diazomethane. After concentration under a nitrogen stream, the sample was analyzed for 2,4-DB and 2,4-D by GC/ECD.

Concurrent method recoveries were conducted by PTRL to determine the adequacy of the method for data collection purposes. Untreated samples of alfalfa and peanut raw and processed commodities were fortified with 2,4-DB, 2,4-D, and 2,4-DCP at 0.05-0.20 ppm. Representative chromatograms, sample calculations, and standard curves were provided. The concurrent method recovery data are presented in Table 1. The recovery data indicate that the GC/ECD method is adequate for 2,4-DB (as well as the 2,4-D, and 2,4-DCP metabolites) data collection in alfalfa and peanut raw agricultural and processed commodities, with an LOQ in alfalfa forage and hay of <0.05 ppm

Storage Stability Data

Upon completion of sampling, samples were immediately placed into chilled coolers (containing ice) and transferred to freezers within 4 hours. Samples were stored frozen (from -7 to -33 F for alfalfa and from 0 to -32 F for peanuts) at the collection site for 0-113 days prior to shipment by freezer truck to the analytical facility, PTRL East, Inc. (Richmond, KY). Here, samples were maintained frozen during the entire storage period until extraction/analysis. In all cases, samples were stored for less than two years between sample collection and sample extraction.

The registrant did not submit any additional storage stability data for 2,4-DB (or 2,4-D or 2,4-DCP), but instead indicated that alfalfa forage and hay are similar to soybean forage and hay which was shown to be stable for a period of at least 25 months (for review, see D. Miller, 4/17/96, CBRS No. 15508, DP Barcode D215038). The registrant also did not provide any storage stability data for peanut nutmeat, vines, hay, and hulls contending that these commodities are similar to soybean seed, forage, hay, and straw, respectively.

CBRS will translate storage stability data from soybean commodities reviewed previously

Table 1. Concurrent method recoveries of 2,4-DB, 2,4-D, and 2,4-DCP from fortified samples of alfalfa and peanut matrices[a]

Commodity	Fortification level, ppm	Mean Percent Recovery ± SD Recovery Range (No. of Samples) 2,4-DB	2,4-D	2,4-DCP
Alfalfa Forage	0.05	95.9% ± 19.6 69.6-124.5% (5)	84.1% ± 23.9 60.6-126.9% (7)	76.0% ± 10.3 66.0-92.6% (6)
	0.10	100.8% ± 16.2 65.5-124.5% (16)	75.7% ± 23.2 60.3-130% (13)	75.0% ± 10.8 61.1-94.1 (11)
	0.20	NA[b]	62.3%	68.1 ± 8.5 61.5-77.7% (3)
Alfalfa Hay	0.05	112.0% ± 13.1 97.6-126.1 (4)	101.8% ± 29.3 68.0-126.6% (4)	98.8% ± 16.4 78.0-116.1% (4)
	0.10	100.8% ± 20.4 66.9-125.2 (13)	80.4% ± 14.6 61.3%-100.1% (11)	80.9% ± 13.9 65.3-117.2 (13)
	0.20	119.9%	110.3% 106.4-114.2% (2)	NA
Peanut Vines	0.10	112%, 123%	60%. 101%, 103%	78%
	0.20	111%	NA	71%
Peanut Hay	0.05	NA	NA	65%
	0.10	67%, 107%	60%, 74%	69%
Peanut Hulls	0.05	108%	86%	109%, 91%
	0.10	NA	91%	NA
	0.20	121%	NA	NA
Peanut Nutmeat	0.05	66%, 87%	105%, 123%	71%, 67%
Peanut Meal	0.10	117%	77%	118%
Peanut Crude Oil	0.10	62%	61%	89%
Peanut Refined Oil	0.10	88%	62%	93%

a	Each recovery value represents one sample unless otherwise indicated by multiple entries or recovery means, ranges, and number of samples
b	NA= Not Available

to alfalfa and peanut commodities. Since 2,4-DB has been found to be stable in soybean commodities for periods of at least 25 months, CBRS concludes there are no storage stability concerns associated with the present alfalfa and peanut field trial studies.

Magnitude of the Residue in Alfalfa and Peanut RACs

Established tolerances: Tolerances have been established for the combined residues of 2,4-DB and 2,4-D in/on alfalfa forage and peanut nutmeat at 0.2 ppm [40 CFR §180.331]. No tolerances have been established for alfalfa hay or for peanut hay, meal, or oil (peanut vines and hulls are no longer considered significant feed items and tolerances are therefore no longer established on these commodities). The HED Metabolism Committee has determined that the tolerance expression should be changed to include 2,4-DB only.

Registered use patterns: A REFS search conducted 4/03/96 identified nine 2,4-DB end-use products (see Table 2, below) registered to the members of the 2,4-DB Task Force for use on alfalfa and/or peanuts:

Table 2. Active 2,4-DB End-use Products Having Field Crop Uses on Alfalfa and/or Peanuts that are Registered to Members of the 2,4-DB Task Force[a].

Active Ingredient (code)/ EPA Reg No.	Formulation [b]	Label Date	Trade Name
(4-(2,4-dichlorophenoxy)butyrate, dimethylamine (30819)			
264-105	SC	4/94	Butyrac 200 Broadleaf Herbicide
264-164	SC	4/94	Butyrac 175
2749-126	SC	3/94	Aceto 2,4-DB 175
2749-516	SC	9/94	2,4-DB 200 Weed Killer
56077-26	SC	12/94	Butoxone 200 Herbicide
56077-28	SC	9/95	Butoxone SB
56077-31	SC	9/94	Butoxone Herbicide
56077-52	SC	2/96	Butoxone 7500 Herbicide
(4-(2,4-dichlorophenoxy)butyrate, isooctyl ester (30863)[c]			
2749-268	EC	12/73	2,4-DB Ester Selective Herbicide

[a] Members of the 2,4-DB Task Force are: A.H. Mark Co. (959065), Rhone-Poulenc Ag Company (264), Aceto Agriculture Chemicals Corp. (2749), and Cedar Chemical Corporation (56077).

[b] The active ingredient for the formulated products is expressed as the acid equivalent.

[c] Per SRRD, the 2,4-DB Task Force no longer intends to support this product.

2,4-DB formulations registered for alfalfa (EPA Reg. Nos. 264-105, 264-164, 2749-268, 2749-516, 56077-26, 56077-31, and 56077-52) permit applications of up to (i) 1.5 lbs ae/A post-

emergence to seedling or established alfalfa with no PHI or restrictions against feeding/grazing alfalfa forage or hay; or (ii) up to 1.5 lbs ae/A prior to flowering with the restriction that established alfalfa (hay/straw) not be grazed or fed to livestock within 30 days of treatment and that seedling alfalfa not be grazed or fed within 60 days of treatment.

2,4-DB formulations registered for peanuts (EPA Reg. Nos. 264-105, 264-164, 2749-126, 2749-516, 56077-26, 56077-28, 56077-31, and 56077-52) permit applications (i) up to two applications at 0.4 lbs ae/A each with the second application made no later than late bloom stage (ca. 90-100 days after planting) with a PHI of 30 days and a restriction against feeding treated vines or hay to livestock; or (ii) an unlimited number of applications of up to 0.4 lbs ae/A per application two to twelve weeks after planting with a PHI of 30 days[1] and a restriction against feeding treated vines or hay to livestock.

Discussion of the data:

Alfalfa: The 2,4-DB Task Force submitted data from 23 trials conducted at 14 sites in the states of CA(2), IA(2), MI(2), NE(2), NY(2), PA(1), WI(1), SD(1) and MN (1) depicting the magnitude of residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on alfalfa forage. An additional 23 parallel studies were performed with alfalfa hay (discussed later). At each of the 14 trial sites, alfalfa in separate plots was treated using ground equipment at a nominal 1.5 lbs ae/A according to one of the following treatment schedules:

- for fall-seeded crops, crops were planted and treated in the fall and harvested the following spring. Generally, "first cutting" samples were collected in the spring when alfalfa was in the pre-bloom to early-bloom stage. Subsequent samples (from separate portions of the plots) were taken approximately 30 days (usually mid- to late- bloom) and approximately 60 days (usually post bloom) following the initial cutting and were designated "second cutting" and "third cutting", respectively.

- For the spring-seeded crops, crops were planted and treated in the spring and harvested approximately 30, 60, and 90 days following application. The plants were generally at the same stage of development as those harvested in the fall.

- For the established fall-treated crops, plots were treated in the fall and harvested when it was acceptable for a commercial "first cutting" harvest. The subsequent samples were taken approximately 30, 60, and 90 days following treatment.

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[1] The label for peanuts on EPA Reg. No. 264-105 is contradictory: instructions indicate that the product can be applied at up to 12 weeks (or 84 days) after planting, but state subsequently that it should not be applied later than 100 days after planting.

- For the spring-treated crops, plots were treated in the spring and harvested approximately 30, 60, and 90 days following treatment.

In each case, the treated area for each plot was subdivided into three parts for each cutting (first, second, or third). Approximately 3 lbs of forage and hay were collected from each trial.

The forage samples were collected and transferred to freezers; the hay samples were allowed to dry in the field until they were considered acceptable for commercial bailing prior to being collected and placed in frozen storage. Alfalfa meal was produced from samples received from IA and NY. However, alfalfa meal in no longer considered to be a significant feed item, and thus no tolerances are required: the data provided by the registrant will not be reviewed.

Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on alfalfa commodities were determined using a GC/ECD method (see "Residue Analytical Methods" section). The results of the alfalfa field trials are presented in Tables 3 through 9.

Apparent residues of 2,4-DB were nondetectable (<0.05 ppm) in/on nine samples of 22 untreated alfalfa forage. Detected levels on the remaining forage control samples ranged from 0.05 ppm to 0.32 ppm. With 26 control hay samples, residues were ND (<0.05 ppm) on 15 samples, with detectable residues of from 0.12 to 0.40 ppm on the remaining untreated samples. The registrant contends that many of these apparent residues were observed primarily as broad, *non-analyte* chromatographic peaks with retention times similar to that of the analyte. While CBRS believes that the registrant did not adequately demonstrate this explanation, CBRS will conclude that these control analyses are acceptable and do not adversely affect interpretation of the data.

Geographic representation is adequate since the test states of CA, IA, MI, NE, NY, PA, WI, SD and MN represent the majority of alfalfa growing regions.

Table 3. Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on fall-seeded alfalfa forage.

Site	PHI, days	Residues, ppm		
		2,4-DB	2,4-D	2,4-DCP
CA-01 (Watsonville)	145	0.16	0.10-0.61	<0.05-0.11
	176	0.11		
	207	0.08		
IA-01 (Waterloo)	269	--	<0.05 (2)	0.12-0.20
	301	<0.05		
	329	<0.05		
MI-01 (Marne)	253	0.19	<0.05	<0.05-0.16
	284	<0.05		
	313	<0.05		
NE-01 (York)	247	0.09	<0.05	0.08-0.09
	277	0.08		
	306	0.08		
NY-01 (Waterloo)	262	0.10	<0.05	0.21
	295	--		
	323	--		
PA-01 (Hamburg)	202	0.20	<0.05	<0.05-0.08
	232	0.16		
	261	0.20		

Table 4. Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on fall-seeded alfalfa hay treated with 2,4-DB.

Site	PHI, days	Residues, ppm		
		2,4-DB	2,4-D	2,4-DCP
CA-01 (Watsonville)	145	0.13	<0.05	0.06(3)
	176	0.07		
	207	0.08		
IA-01 (Waterloo)	269	0.06	<0.05	0.10-0.14
	301	--		
	329	<0.05		
MI-01 (Marne)	253	<0.05	0.08-0.11	<0.05-0.19
	284	<0.05		
	313	<0.05		
NE-01 (York)	247	<0.05	<0.05	<0.05-0.33
	277	<0.05		
	306	<0.05		
NY-01 (Waterloo)	262	<0.05	<0.05	<0.05-0.09
	295	--		
	323	<0.05		
PA-01 (Hamburg)	202	0.81	<0.05 <0.05-0.31	<0.05-0.16 <0.05-0.22
	232	0.16		
	261	0.32		

Table 5. Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on spring-seeded alfalfa forage treated with 2,4-DB.

Site	PHI, days	Residues, ppm		
		2,4-DB	2,4-D	2,4-DCP
CA-01 (Watsonville)	30	0.34	0.05-0.09	<0.05-0.09
	62	1.53		
	88	0.06		
IA-01 (Waterloo)	38	<0.05	<0.05	<0.05
	60	<0.05		
	88	<0.05		
MI-01 (Marne)	30	0.17	<0.05-0.12	<0.05-0.13
	61	<0.05		
	91	0.11		
MN-01 (Hills)	31	0.07	<0.05	<0.05-0.07
	60	<0.05		
	90	0.06		
NE-01 (York)	30	0.07	<0.05	0.07-0.08(2)
	59	0.08		
	90	0.08		
NY-01 (Waterloo)	29	0.38	<0.05(2)-0.08	0.07-0.20
	62	0.14		
	90	0.36		
PA-01 (Hamburg)	28	0.36	<0.05	0.06-0.36
	60	0.06		
	90	0.19		
SD-01 (Renner)	30	0.19	<0.05-0.21	<0.05(2)-0.06
	60	<0.05		
	90	<0.05		
WI-01 (Delavan)	28	0.40	<0.05	<0.05(2)-0.11
	61	<0.05		
	90	0.26		

Table 6. Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on spring-seeded alfalfa hay treated with 2,4-DB.

Site	PHI, days	Residues, ppm		
		2,4-DB	2,4-D	2,4-DCP
CA-01 (Watsonville)	30	0.27	<0.05	0.06-0.12
	62	0.18		
	88	0.12		
IA-01 (Waterloo)	38	<0.05	<0.05	<0.05-0.24
	60	0.24		
	88	0.06		
MI-01 (Marne)	30	0.20	<0.05-0.08	<0.05-0.09
	61	<0.05		
	91	<0.05		
MN-01 (Hills)	31	0.06	<0.05-0.07	<0.05-0.09
	60	<0.05		
	90	0.06		
NE-01 (York)	30	0.10	<0.05-0.07	<0.05-0.23
	59	0.17		
	90	0.17		
NY-01 (Waterloo)	29	0.44	<0.05	<0.05-0.20
	62	0.09		
	90	<0.05		
PA-01 (Hamburg)	28	1.68	<0.05	<0.05-0.13
	60	<0.05		
	90	<0.05		
SD-01 (Renner)	30	0.19	0.05-0.21	<0.05
	60	0.09		
	90	0.06		
WI-01 (Delavan)	28	0.25	<0.05-0.25	<0.05-0.17
	61	0.11		
	90	0.09		

Table 7. Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on established alfalfa forage (fall application) treated with 2,4-DB.

Site	PHI, days	Residues, ppm		
		2,4-DB	2,4-D	2,4-DCP
CA-02 (Westley)	127	<0.05	<0.05	<0.05-0.06
	158	0.15		
	186	<0.05		
IA-02 (Cedar Falls)	246	0.10	<0.05-0.10	<0.05-0.10
	276	<0.05		
	309	0.08		
NY-02 (Phelps)	224	0.10	<0.05-0.09	0.10-0.25
	253	0.13		
	283	0.16		
WI-02 (Delavan)	237	0.06	<0.05	<0.05-0.06
	267	<0.05		
	296	<0.05		

Table 8. Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on established alfalfa forage (spring application) treated with 2,4-DB.

Site	PHI, days	Residues, ppm		
		2,4-DB	2,4-D	2,4-DCP
CA-02 (Westley)	32	0.26	<0.05-0.12	0.09-0.37
	59	0.06		
	91	<0.05		
IA-02 (Cedar Falls)	34	<0.05	<0.05	<0.05-0.09
	63	0.09		
	95	0.08		
NY-02 (Phelps)	32	2.23	<0.05-0.09	0.06
	61	0.08		
	91	0.11		
WI-02 (Delavan)	31	0.49	<0.05-0.09	<0.05-0.24
	61	<0.05		
	90	<0.05		

Table 9. Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on established alfalfa hay (spring application) treated with 2,4-DB.

Site	PHI, days	Residues, ppm		
		2,4-DB	2,4-D	2,4-DCP
CA-02 (Westley)	32	0.49	0.08-0.17	0.09-0.30
	59	0.08		
	91	<0.05		
IA-02 (Cedar Falls)	34	<0.05	<0.05-0.07	0.17-0.23
	63	<0.05		
	95	<0.05		
NY-02 (Phelps)	32	8.34	<0.05-0.52	<0.05-0.23
	61	<0.05		
	91	0.10		
WI-02 (Delavan)	31	0.33	<0.05-0.18	0.12-0.19
	61	<0.05		
	90	<0.05		

The submitted alfalfa field trial data are adequate to satisfy reregistration requirements for magnitude of the residue in alfalfa forage; The registrants have provided sufficient field trial data reflecting various registered use patterns including the use pattern that CBRS considers likely to contribute to maximum residue occurrence. The residues of 2,4-DB in/on alfalfa forage at 30, 60, and 90 days ranged from ND (<0.05) to 0.49 ppm (excluding a 2.23 ppm outlier as per Dixon outlier test), ND to 0.15 ppm (excluding a 1.53 ppm outlier as per Dixon outlier test), and ND to 0.26 ppm, respectively, in/on alfalfa following fall or spring treatment with 1.5 lbs ae/A per label directions. The current tolerance for alfalfa forage of 0.2(N) ppm is inadequate: the registrant should propose to increase the tolerance to 0.7 ppm and propose a 30 day PHI.

There is no current tolerance for alfalfa hay. Based on a 30 day pre-cutting interval and the data presented in Tables 3-9, the registrant should propose a tolerance on alfalfa hay of 2 ppm (CBRS considers the 8.34 ppm value to be an outlier per the Dixon outlier test).

Peanuts The 2,4-DB Task Force submitted data from 11 trials conducted at 11 sites in the states of AL(2), FL, GA(3), NC, TX(3), and VA depicting the magnitude of residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on peanut vines, nutmeat, hulls, and hay. At each of the 11 trial sites, 2,4-DB was applied to peanuts (broadcast) at 0.4 lbs ae/A four to five weeks after planting while the plants were in the pre-pegging (vegetative) stage. Eight to nine weeks after planting, a second 0.4 lb ae/A was applied to the same crops when most plants were in the pegging and blooming (reproductive) stage.

Harvesting occurred when the plants reached a maturity appropriate for commercial harvesting. In general, the vine samples were collected ca. 1-5 days prior to the anticipated harvest date and the nutmeat and hulls were collected together as whole peanuts. The hay (consisting of dry vines, roots, and immature nuts) was collected at the same time as the peanuts.The samples were collected, placed in bags in coolers in the field, and transferred to freezer storage within 4 hours of collection.

Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on peanut commodities were determined using a GC/ECD method (see "Residue Analytical Methods" section).

Apparent residues of 2,4-DB were nondetectable (<0.05 ppm) in/on two of 2 samples of untreated peanut nutmeat, three of 3 samples of untreated vines, and 1 of two samples of peanut hulls. One untreated peanut hull showed residues of 0.14 ppm and four samples of peanut hay displayed residues of 0.09, 0.26, 0.21, and 0.06 ppm. CBRS believes that these control analyses are acceptable.

The submitted peanut field trial data are adequate to satisfy reregistration requirements for magnitude of the residue in peanut nutmeat; The registrants have provided sufficient field trial data reflecting the registered use pattern. Residues of 2,4-DB in/on all 11 samples of peanut nutmeat following an application of 2,4-DB at 0.4 lbs ae/A (4-5 weeks after planting) and a second application of 0.4 lbs ae/A at 8-9 weeks following planting were ND (<0.05). These application schedules represent PHIs of 53 to 104 days. The current tolerance (based on combined residues of 2,4-D and 2,4-DB for peanut nutmeat of 0.2(N) ppm can be lowered to

0.05 ppm: the registrant should petition to decrease the current tolerance to 0.05 ppm.

Geographic [redacted] is adequate since the test states of AL, FL, GA, NC, TX, and VA represent the [redacted] of peanut growing regions.

There is no current tolerance for peanut hay. Following two treatments at 0.4 lbs ae/A, residues in peanut hay from the 11 trial sites ranged from 0.08 ppm to 0.55 ppm. Based on a 53-104 day pre-cutting interval and the field trial data presented by the registrant, the registrant should either propose a tolerance on alfalfa hay of 0.6 ppm or amend all labels to prohibit the grazing or feeding of treated hay to livestock.

There are presently no 2,4-DB tolerances on peanut vines or hulls. Per Table II (September, 1995), CBRS no longer considers these commodities to be significant feed items. Therefore, no tolerances for these items need be proposed.

Magnitude of the Residue in Processed Peanut Commodities

Established tolerance: No tolerances have been established for residues of 2,4-DB in any peanut processed commodity.

Discussion of the data: The 2,4-DB Task Force submitted data (1995; MRID 43621201) pertaining to the potential for concentration of 2,4-DB residues of concern in the processed commodities of peanuts. In two tests conducted in GA and TX, peanuts were harvested following a broadcast application of 2,4-DB at rates up to 1.2 lbs ae/A four weeks after planting followed by a second application at rates up to 1.2 lb ae/A eight weeks after planting.

Peanut samples were processed according to simulated commercial procedures at the Food Protein and Development Center at Texas A&M University. Briefly, peanuts were dried if necessary to 7-12% hull moisture content and cleaned with a Kice aspirator to separate light impurities. Hulls were separated from the kernels with a peanut sheller, and the hull material separated from the kernel and collected by aspiration. The kernels were dried to 7-10% moisture content, moisture conditioned to 12%, heated to 200-220 F and pressed to liberate part of the crude oil. The press cakes (pressed kernels) were flaked, and the remaining crude oil extracted from the flaked presscakes with hexane. Residual hexane was removed from the extracted flakes (collets) with warm air. The crude oil was then combined with the crude oil obtained from pressing and refined by neutralizing with NaOH, stirring, and refrigerating to separate refined oil from soapstock. The resulting commodities (meal (collets), crude oil, and refined oil) were shipped to PTRL East for analysis of 2,4-DB, 2,4-D, and 2,4-DCP residues. Adequate descriptions and material balance information were submitted for the processing procedures.

Residues of 2,4-DB, 2,4-D, and 2,4-DCP in peanut processed commodities were determined using a GC/ECD method (see "Residue Analytical Methods" section). The results of the peanut processing study are presented in Table 10.

Table 10. Residues of 2,4-DB, 2,4-D, and 2,4-DCP in/on peanut nutmeat and peanut processed commodities treated with 2.4-DB at 0.4-, 0.8-, and 1.2- lbs ae/A.

Soybean commodity	Residues, ppm		
	2,4-DB	2,4-D	2,4-DCP
TX-02 (0.4 lb ae/A @ 4 and 8 weeks)			
Nutmeat	0.05	<0.05	<0.05
Meal	<0.05	<0.05	<0.05
Crude oil	<0.05	<0.05	<0.05
Refined oil	<0.05	<0.05	<0.05
TX-02 (0.8 lb ae @ 4 and 8 weeks)			
Nutmeat	0.08	<0.05	<0.05
Meal	<0.05	<0.05	<0.05
Crude Oil[a]	<0.05	<0.05	<0.05
Refined Oil	<0.05	<0.05	<0.05
TX-02 (1.2 lbs ae/A @ 4 and 8 weeks)			
Nutmeat	0.06	<0.05	<0.05
Meal	<0.05	<0.05	<0.05
Crude Oil[a]	<0.05	<0.05	<0.05
Refined Oil	<0.05	<0.05	<0.05
[a] This is no longer a regulated commodity as per Table II (September, 1995)			

As can be seen in the Table, residues of 2,4-DB did not concentrate in meal, or crude and refined oil processed from peanut nutmeat bearing detectable residues of 2,4-DB following treatment with exaggerated rates of 2,4-DB. The peanut processing study is adequate. No separate 409 tolerances or Section 701 MRLs are required for processed commodities of peanuts.

RDI: Pilot Team:4/30/96;RPerfetti:5/14/96;EZager:5/14/96.
cc: RF, SF, List A Rereg. F., Circ., SRRD (J. Coombs); DJM.

13544

R110924

Chemical:	**4-(2,4-Dichlorophenoxy)butyric acid**
PC Code:	**030801**
HED File Code	**11000 Chemistry Reviews**
Memo Date:	**05/15/1996**
File ID:	**DPD215039; DPD215758**
Accession Number:	**412-05-0098**

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